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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/023,948	12/21/2001	Jae-dong Lee	SEC.861	7681

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VOLENTINE FRANCOS, P.L.L.C.
Suite 150
12200 Sunrise Valley Drive
Reston, VA 20191

EXAMINER

UMEZ ERONENI, LYNETTE T

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 05/07/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

17C

Office Action Summary

Application No.

10/023,948

Applicant(s)

LEE ET AL.

Examiner

Lynette T. Umez-Eronini

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— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 13-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-12 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3 and 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-12 in Paper No. 6 is acknowledged.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 3, 4, 8, 9, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al. (US 5,607,718) in view of Miyashita et al. (US 6,354,941 B1).

Sasaki teaches, "... the slurry prepared by dispersing silica particles (same as applicant's abrasive) in an aqueous pH 11 piperazine solution was used as the polishing agent. However, it is also possible to use amines (same as applicant's pH controlling agent) such as ... choline (same as applicant's choline derivative), ... as the alkali solution for adjusting the pH (column 22, lines 39-45), which reads on,

a polishing slurry, comprising: an abrasive; deionized water; and a pH controlling agent, **as in claims 1, 3, 4, 8, 9, and 10;** and

a choline derivative such as choline chloride, which is a species that encompasses a generic choline compound, **as in the present claims 5 and 6.**

Sasaki differs in failing to teach polyethylene imine having a molecular structure of $[-CH_2CH_2N(CH_2CH_2NH_2)-]_x[-CH_2CH_2NH_2-]_y$, where x and y are positive integers, **in claim 1**; where x and y may have a value of zero, **in claim 11**; and the polyethylene imine comprises more than 0.02 wt % of the polishing slurry, **in claims 2 and 7**.

Miyashita teaches a polishing agent (column 5, lines 4-9) that includes a water-soluble amine. "The typical examples of the water-soluble amine used in the present invention include, . . . polyethylene imine . . . (column 7, lines 48-53). "The amount of the water-soluble amine is not particularly limited, as far as the performance of the polishing agent can be maintained. Generally, the amine amount is selected appropriately from within a range of 0.1 to 20% by weight (which encompasses applicant's polyimine comprising more than 0.02 wt % or the polishing slurry in the present claims 2 and 7) so as to achieve a desired pH value, i.e., 8 to 11, of the polishing agent in the polishing step" (column 7, lines 58-63). Using Miyashita's polyethylene imine, which is the same composition that is used in a polishing solution of the present invention, would result in the polyethylene imine having a molecular structure of $[-H_2CH_2N(CH_2CH_2NH_2)-]_x[-CH_2CH_2NH_2-]_y$, where x and y are positive integers and encompasses the polyethylene imine comprising more than 0.02 wt % of the polishing slurry as claimed in the present invention.

It is the examiner's position that it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Sasaki by using Miyashita's polyethylene imine in a polishing slurry for the purpose of having a water-soluble amine that has a weak basicity that tends to be excellent in preservation

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capability and polishing function when used in a polishing agent (Miyashita, column 7, lines 65-67).

4. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki ('718) in view of Miyashita ('913 B1) applied to claim 1 above, and further in view of Kimura (US 5,869,392).

Sasaki in view of Miyashita differs in failing to specify the choline derivative comprises 1.3 wt % of the polishing slurry.

Kimura teaches, "... In the CMP process, chemical polishing variables include the kind, pH, and composition of solvent; and mechanical polishing variables include the kind and concentration of slurry ... (column 4, lines 11-16), which provides evidence that the concentration of a polishing slurry is a so-called "result effective variable."


It is the examiner's position that it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Sasaki in view of Miyashita by using Kimura as evidence that the concentration of slurry is a so-called "result effective variable" since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini on the First Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on 703-308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

ltue
May 5, 2003


BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

CLAIMS:

What is claimed is:

1. A polishing slurry, comprising: an abrasive; deionized water; a pH controlling agent; and polyethylene imine having a molecular structure of $[-CH_2CH_2N(CH_2CH_2NH_2)_x-CH_2CH_2NH_2]_y$, where x and y are positive integers.
2. The polishing slurry of claim 1, wherein the polyethylene imine comprises more than 0.02 wt % of the polishing slurry.
3. The polishing slurry of claim 1, further comprising a choline derivative.
4. The polishing slurry of claim 2, further comprising a choline derivative.
5. The polishing slurry of claim 3, wherein the choline derivative is choline chloride.
6. The polishing slurry of claim 4, wherein the choline derivative is choline chloride.

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7. The polishing slurry of claim 5, wherein the polyethylene imine comprises more than 0.02 wt % of the polishing slurry.

8. The polishing slurry of claim 3, wherein the choline derivative is one selected from the group consisting of choline chloride, choline base, choline bromide, choline iodide, choline dihydrogen citrate, choline bitartrate, choline bicarbonate, choline citrate, choline ascorbate, choline borate, choline theophyllinate, choline gluconate, acetylcholine chloride, acetylcholine bromide, and methacholine chloride.

9. The polishing slurry of claim 4, wherein the choline derivative is one selected from the group consisting of choline chloride, choline base, choline bromide, choline iodide, choline dihydrogen citrate, choline bitartrate, choline bicarbonate, choline citrate, choline ascorbate, choline borate, choline theophyllinate, choline gluconate, acetylcholine chloride, acetylcholine bromide, and methacholine chloride.

10. The polishing slurry of claim 1, wherein the abrasive is one selected from the group consisting of silica, alumina, titania, zirconia, germania, and ceria.

11. The polishing slurry of claim 1, wherein one of x and y may have a value

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of zero (0).

12. The polishing slurry of claim 3, wherein the polyethylene imine comprises 0.5 wt % of the polishing slurry, and the choline derivative comprises 1.3 wt % of the polishing slurry.

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PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020123224 A1

TITLE: Chemical mechanical polishing slurry

PUBLICATION-DATE: September 5, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Lee, Jae-dong	Seoul		KR	
Yoon, Bo-un	Seoul		KR	
Hah, Sang-rok	Seoul		KR	

US-CL-CURRENT: 438/689